“TECH TIPS” and FAQ’s

By Jay McCown

Our goal with “Tech Tips” is to share technology information with industry stakeholders, with the goal of providing a better understanding of Radio Frequency Identification (RFID) and related technology as it is actually used in the livestock industry. Much of the information included here was gained thru field experience gathered over the many years I’ve worked in the animal ID industry. In the months ahead I also hope to include information from other sources as well. So if you have personal knowledge, experiences, questions, or just ideas you’d like to share with others, please feel free to contact me at rangerid@hughes.net anytime, and I’ll try to include you in our discussions. Periodically I’ll post relevant articles that will help you better understand and use RFID technology in your livestock operations.

See articles below:

TECH TIP #1 (April 2009)

What is an electronic (RFID) tag?

First of all, any electronic tag is a device which stores within it, a unique identification number and/or specific information about the item it is ultimately attached to. RFID tags can be active or passive, which simply means that they are either internally powered or are externally powered. Both types of tags are currently used in the animal world; however the predominant animal tag used globally is the passive RFID tag, principally because they are less costly. Although there are numerous RFID tag technologies (Low Frequency (LF), High Frequency (HF), Very High Frequency (VHF), Ultra-High Frequency(UHF) and Super High Frequency (SHF)), the dominant RFID technology used for individually tracking fish, wildlife, and livestock globally are Low-Frequency (134.2 KHz) RFID tags, based on the international ISO 11784 and ISO 11785 standard.

These LF tags are found in a wide variety of physical configurations depending upon the animal ID application they are employed in, but the most frequently used configurations are the circular plastic covered ear tag, and the glass encapsulated injectable tag (as shown in Figure 1 and 2 respectively).

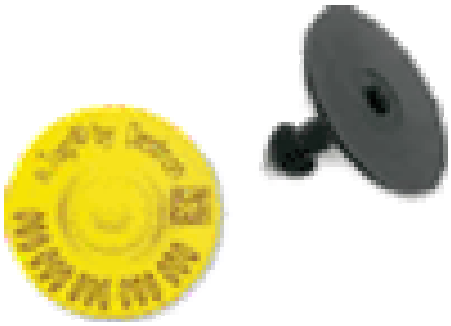

Figure 1 – LF Livestock ear tag

Shown larger than actual size

Figure 2 – LF Implantable Tag

The tags shown above are passive tags and have no internal power source. These tags are only activated and read when they are exposed to the electro-magnetic field of a reader antenna, which induces power to the internal tag circuitry. Depending upon the reader used, most LF tags have a read range of less than 4 feet.

So why are Low Frequency Tags (134.2 KHz) the primary RFID tag used for animal identification? There are several reasons:

1.) They operate at frequencies which can easily penetrate bio-mass, which is especially important for animals with implantable tags
2.) Currently, there are no 11mm implantable high-frequency tags available
3.) They work in all weather conditions and can easily be read under water
4.) They perform better in harsh outdoor environments that animals are often found.
5.) They operate more reliably in environments with metal objects located nearby
6.) They provide detection of an animal at close range, and are not as prone to identifying other animals outside the desired detection zone.
7.) Millions of animals (fish, wildlife, and livestock) around the globe are currently tagged with LF tag technology.
8.) Low frequency (LF) tags comply with the International Standards Organization ISO 11784/11785 for use with animals

Although LF tags are the current standard for animal ID, there are new technologies on the horizon, and in the years ahead, one of these new technologies will likely emerge and new standards will be developed.

Electronic ear tags are easily applied to the ear of the animal by using a low cost tag applicator, whereas an implantable tag requires a special syringe to inject them into animal as shown in figure 3 below.

Figure 3 – Implantable Tag syringe

There are many brands of ear tags that are currently on the market today, and the performance characteristics of each tag can vary measurably depending upon: brand, reader system used, environmental conditions, etc. The size, and type of tag used depends upon the species of animal, i.e. (Cattle use standard ear tags, sheep/hogs/goats use a slightly smaller ear tag, and horses use implantable tags)

Most ear tags sell today for around $2, and implantable tags sale for approximately $15. Pricing is further dependent upon quantity purchased and both types of tags are widely available from various suppliers.

TECH TIP #2 (May 2009)

Which brand of EID Tag should I use?

One of the most asked questions I get from people who want to begin using RFID technology in their own operations is "What is the best electronic identification (EID) tag to use. This is always a difficult question for me to answer, mainly because customers are driven by so many different business motives, especially cost. So quality may be a secondary issue for them. Some have the attitude that if there is any difficulty scanning the electronic ear tag somewhere down the line in the livestock supply chain; let that feedlot, auction barn, or packing plant worry about it.

Today, individual livestock identification is still a voluntary program under USDA, although that may be changing soon. Regardless, there are a growing number of feedlot and packing plant operations that have invested in the installation of RFID scanning equipment in recent years to read electronic ear tags. These facilities may be required by USDA to identify imported cattle (i.e. from Canada), or they have specific buyers that pay a premium for age/source/individually identified livestock, and electronic identification equipment can automate the processing of those livestock into and out of their facility.

Recently I had a conversation with a production manager (who will remain nameless) at a packing plant facility that I outfitted here in the Northwest, that encounters poorly tagged livestock nearly every week. After a few weeks or months, he can name the operations by memory that use low quality tags, and are sloppy in how they attach the tags to the animal. But he also knows the names of each of the producers and facilities that tag their animals properly. Bottom line, this issue doesn't go un-noticed by the animal handler, facility manager or livestock buyer, so market forces will inevitably play a role in tag selection and how tags are applied to animals.

Electronic animal identification is still in its early stages and the problems just described are not new to the product labeling industry at large. This is especially true of products that are bar code labeled today. Over 25 years ago, bar coding was in the early stages of being adopted and the quality of product labeling by manufacturers was less than stellar. I can often remember impatiently waiting in the checkout line while the cashier repeatedly scanned the product and then finally gave up and entered the product number by hand. Although this still happens occasionally, the bar code product labeling process and the equipment that is used for scanning them has improved significantly over the years.

So what is my answer to the question, "what is the best electronic identification tag to use? Since I'm an independent system integrator and sell most of the major brands of RFID technology used for animal identification today, I won't

provide a specific recommendation here. Besides, this article is much to short to cover all the variables that could be considered in determining the best performing tag for a particular livestock operation. I might be persuaded to provide you my personal recommendation in private, but for purposes of this article and this particular question I would answer this way:

Purchase an EID tag that is USDA and/or CCIA (Canadian Cattle Identification Association) approved and incorporates the country of origin number in its first three digits ("840" is the United States country of origin). Tags that are approved by these two agencies will perform well using most of the known brands of RFID reader equipment available today. In addition to meeting performance standards, tags certified by these two agencies will also meet minimum standards for retain-ability, durability, ease of application, etc.

In addition to the physical and performance considerations mentioned, you'll find that USDA certified EID tags will also meet the COOL (Country of Origin Label) requirements for individual animal identification for country of origin, and also for use in a variety of National animal disease management programs.

In the months ahead I'll explore other tag related issues that you'll find interesting, including information on reader equipment, facility considerations, and much more.